

EFFECTS OF RED FRUIT (*Pandanus conoideus* Lam) OIL ON MALONDIALDEHYDE LEVEL AND SPERMATOZOA QUALITY IN MICE (*Mus musculus*) EXPOSED TO MONOSODIUM GLUTAMATE

Agustina Widayati¹, Widjiati², Alfiah Hayati³

¹Reproductive Health Science Study Program, Faculty of Medicine, ²Department of Embryology, Faculty of Veterinary Medicine, ³Biology Study Program, Faculty of Science and Technology, Universitas Airlangga, Surabaya, Indonesia

ABSTRAK

Penelitian ini bertujuan untuk mengetahui pengaruh pemberian minyak buah merah (*Pandanus conoideus* Lam) terhadap kadar MDA dan kualitas spermatozoa pada mencit (*Mus musculus*) yang dipapar MSG. Kualitas meliputi motilitas, viabilitas, konsentrasi, dan morfologi spermatozoa. Penelitian dilakukan dengan desain studi eksperimental randomized post-test only control group. Subyek penelitian ini adalah mencit (*Mus musculus*) sejumlah 25 ekor, dibagi menjadi 5 (5 ekor mencit per kelompok). K-: Kelompok dengan pemberian distilled water selama 35 hari. K+: Kelompok dengan pemberian MSG 4 mg/g BB selama 21 hari. P1, P2, dan P3: Kelompok perlakuan pemberian MSG 4 mg/g BB selama 21 hari + minyak buah merah 0,02; 0,04; 0,08 ml/g BB pada hari ke 22-35. Hasil penelitian menunjukkan rerata morfologi spermatozoa kelompok K-, K+, P1, P2, P3 secara berurut-urut sebagai berikut: 0,86; 0,56; 0,67; 0,61; dan 0,87 (%). Konsentrasi spermatozoa secara berurut-urut sebagai berikut: 21; 10; 15; 32,8; dan 19 (107 sel/ml). Viabilitas spermatozoa secara berurut-urut sebagai berikut: 0,64; 0,14; 0,24; P2: 0,36; 0,68 (%). Kadar MDA secara berurut-urut sebagai berikut: 0,29; 0,60; 0,35; 0,23; 0,19 (nm). Sebagai simpulan, kadar MDA testis yang dipapar MSG dan diberi minyak buah merah lebih rendah daripada kadar MDA mencit yang dipapar MSG dan tanpa diberi minyak buah merah. Kualitas spermatozoa pada mencit yang dipapar MSG dan diberi minyak buah merah lebih tinggi daripada mencit yang dipapar MSG dan tanpa diberi minyak buah merah. (FMI 2018;54:84-88)

Kata kunci: Minyak buah merah; MSG; spermatozoa; kadar MDA; kualitas spermatozoa

ABSTRACT

This study aimed to determine the effects of red fruit (*Pandanus conoideus* Lam) oil on MDA levels and spermatozoa quality in mice (*Mus musculus*) exposed to MSG. The quality includes motility, viability, concentration, and morphology of spermatozoa. This experimental study used randomized post-test only control group design. The subjects of this study were 25 mice (*Mus musculus*), divided into 5 groups (5 mice per group). K- group received distilled water for 35 days. K+ group received 4 mg/g BW MSG for 21 days. P1, P2, and P3 treatment groups received 4 mg/g BW MSG for 21 days and 0.02; 0.04; 0.08 ml/g BW red fruit oil, respectively, from day 22 to 35. The results showed that mean spermatozoa morphology in K-, K+, P1, P2, P3 groups were as follows: 0.86; 0.56; 0.67; 0.61; and 0.87 (%). The spermatozoa concentrations were sequentially as follows: 21; 10; 15; 32,8,19 (107 cells/ml). The spermatozoa's vitalities were as follows: 0.64; 0.14; 0.24; P2: 0.36; 0.68 (%). MDA levels were respectively: 0.29; 0.60; 0.35; 0.23; and 0.19 (nm). As a conclusion, testicular MDA levels in mice exposed to MSG and given with red fruit oil were lower than those in mice exposed to MSG without receiving red fruit oil. The quality of spermatozoa in mice exposed to MSG and receiving red fruit oil was higher than that of mice exposed to MSG without being given with red fruit oil. (FMI 2018;54:84-88)

Keywords: Red fruit oil; MSG; spermatozoa; MDA levels; quality of spermatozoa

Correspondence: Alfiah Hayati, Biology Study Program, Faculty of Science and Technology, Universitas Airlangga, Surabaya, Indonesia. Email: alfiahayati64@yahoo.com

INTRODUCTION

Infertility is one of the problems of reproductive health. The prevalence of infertility is also increasing, and not only can be experienced by women, but also by men. Male factor is the major cause of all cases of infertility (Fritz & Speroff 2011). Lifestyle changes and technological advances make individuals increasingly consume fast food. Finally, they depend on food preserved using chemicals, such as flavoring, which mostly consists of monosodium glutamate (MSG). Monoso-

dium glutamate (MSG) is one of the cytotoxic substances that will be metabolized by the body and react to form free radicals. One of its effects is that it can be cytotoxic to male reproductive system which can lead to decreased quality of spermatozoa and increased levels of testicular malondialdehyde (MDA) (Hayati 2011). Radical compounds (Reactive Oxygen Species, ROS) produced from metabolism of toxic substances can decrease the availability of antioxidant reserves of the body and oxidative stress (Birben et al 2012). The condition of the body experiencing oxidative stress